**Summary**

Many sub-Saharan African countries have seen reversals in child mortality trends that have been attributed to the HIV epidemic. Rural areas have higher child mortality rates than urban centers and KwaZulu Natal has the most advanced epidemic in the country. Child mortality data collected by the Africa Centre in northern KwaZulu Natal through its demographic surveillance system covering a population of over 89,000 registered individuals will be investigated for variations in levels of mortality to identify the age group most affected by changes in an attempt to understand the impact of HIV/AIDS and other determinants of child mortality.

**Background**

Variations in childhood mortality in South Africa indicate a need to investigate and monitor inequalities in health status and socio-economic conditions. Surveys conducted by the Human Sciences Research Council from 1988- mid1992 (Roussouw & Hofmeyr, 1990) report that important determinants appear to be population group, province and urban/rural residence. The subsequent Demographic and Health Survey conducted in 1998 found similar variations (Department of Health 2002). These analyses however, did not look at determinants of childhood mortality in a way that other variables were adjusted for.

South Africa has experienced one of the world's most rapidly progressing HIV epidemics and child mortality rates have been reversed (Nannan *et al*., 2000). Annual HIV prevalence surveys amongst ante-natal clinic attendees since 1990 have been the most consistent source of data tracking the spread of the epidemic. The prevalence of HIV in this population has increased at an alarming rate of 0.7% in 1990 to 26.5% in 2002 (Department of Health, 2003). This survey data has consistently shown there is however considerable inter-provincial difference and that the KwaZulu Natal province has the most advanced epidemic in the country – where 36.5% (95% CI: 33.8-39.2) of pregnant women were HIV-infected in the 2002 survey.

The Africa Centre, situated in northern KwaZulu Natal, has a demographic surveillance system covering a population of over 89,000 registered individuals. Social and economic conditions such as levels of unemployment, access to health services and household conditions reflect poor infrastructure as well as the increased poverty rate of individuals living in rural areas compared with the urban populous (May, 2004). Although the area as a whole can be described as poor, enough socioeconomic variation exists to illicit important differentials in adult mortality in this setting (Hosegood *et al*, 2004).

It is not clear what the important determinants of child health are within a rural setting and to what extent the socioeconomic variations influence the health of the children. Furthermore, questions about the impact of HIV on child mortality, their conditions and circumstances in this setting need further investigation. It is likely that differentials by socioeconomic status will be found in the child mortality.

This paper will investigate

1) the determinants of child mortality among a relatively homogeneous population in a defined geographical area, and
2) investigates which age groups are most sensitive to conditions of poverty

**Theoretical focus**

A key demographic variable of under- five mortality is age, yet the age factor is not explicit in either the Mosely and Chen conceptual framework (Mosely and Chen, 1984) or the "malnutrition-infectious disease syndrome" model developed by van Norren and van Vianen (1986). The determinants included in such models are likely to have different importance at different ages. Infants have a far greater risk of dying with deaths being more concentrated within the first week and month of life, than children between their first and fifth birthday because biomedical causes of death have specific age patterns. The infant mortality rate is therefore broken down into smaller age groups: the early, late and post-neonatal periods based on the different biological risk factors at different ages. It will be important to draw on such examples of conceptual frameworks which use the neonatal and post-neonatal ages as presented for example by Bicego and Boerma (1993).

For policy direction in South Africa, age at death is an important determinant to understand. Targeting improvements in neonatal mortality would mean a health services intervention but improving the post-neonatal mortality would need improvement related to socioeconomic and environmental conditions. Implementing such an intervention requires quite different policy formulation.

**Methods**

Retrospective birth histories from 1981-2000 are used to estimate level and trend and additional prospective data are used to extend the trend for another two years. Poisson regression models will be used to investigate mortality by selected socioeconomic status variables such as household access to water and electricity, the number of household assets and demographic variables such as age and sex.

**Findings**

The data are of high quality. The Africa Centre data corroborate the level and trend of childhood mortality estimates from other data sets very well, in particular the 1998 DHS. The historical trend is very similar to that of the country except that the declines in the early part of the 1980s in this area appear less pronounced. These data confirm a reversal in child mortality which begins in the study area around 1990 when ${}_5q_0$ was 68 per 1000 live births and peaks with ${}_5q_0$ of 117 in 2000.

It is hypothesised that in the outlined setting, gradients of child mortality will be associated with household living conditions and other indicators of socioeconomic status and demographic characteristics.

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